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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,715	06/11/2001	Stephen John McLoughlin	01 PAT 140	2076

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EXAMINER

JONES, ROBERT D

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 12/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/878,715

Applicant(s)

MCLOUGHLIN ET AL.

Examiner

Robert D. Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 10-17, 36 and 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 18-35, 38-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Restriction Made Final

1. Applicant's election with traverse of Species I (claims 1-3, 4-9, 18-35, and 38-53) in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the overall effect of using cams, sleeves, and linear actuators is the same i.e. "to place a force between the device housing and the drill string thereby causing the drill bit to move the desired direction." This is not found persuasive because the claimed methods and apparatus used to achieve the overall effect (move the drill bit in the desired direction) defines different inventions. It is not unusual for patentably distinct inventions to achieve a common overall effect. For example, the intended overall effect of essentially all currently patented directional drilling assemblies is to place a force on the drill bit to move the bit in the desired direction. As is the case here, it is the apparatus that defines a patentably distinct invention, not the overall effect achieved by the apparatus.

While it is clear that the linear actuators species is patentably distinct from the cams and sleeves species, the exact relationship between cams and sleeves themselves, as disclosed, is less apparent. In bold letters on page 4 of the Response to Notice to Make Election (Paper 7), Applicant states "**AS USED HERE, SLEEVES and CAMS are the same: there are slight differences, but the two can achieve the same result.**" This argument seems internally contradictory; either cams and sleeves are the same, or they are not -- and, as currently defined for this invention, apparently cams and sleeves are not the same. As noted supra, it is not unusual for patentably distinct inventions to achieve the same result. "Slight differences" frequently define characteristics that differentiate one distinct invention from another. As a result, a directional controller comprising cams defines a distinct invention from a directional

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controller comprising sleeves, which is also patentably distinct from a directional controller comprising linear actuators

Applicant's arguments are not persuasive. Therefore, the restriction requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to because Figures 1, 3, 6, 9, and 14, all have section lines designated as capital letters (usually A-A and B-B). Each of these section lines should be designated with a different Roman or Arabic reference. These changes should be reflected in the Specification as well as the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to because in Figure 1, cross sections A-A and B-B are shown, but there are no figures associated with these cross sections. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to because Figure 6 is identical to Figure 1. Page 19 of the specification indicates that "To avoid unnecessary repetition, the same reference numerals have been used (in Figure 6) as for Figure 1." This is not appropriate unless the components represented by the same reference numbers are identical -- and in this case, the components are not identical. If the components were identical, the figures would be redundant, and it would be appropriate to delete one of the figures. A proposed drawing correction or corrected drawings

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are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because, although the device is described as turning in Figures 5A and 5B, the drill bit is shown as centered in the well bore and not biased in the direction of the turn, as described in the specification. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to because no crosshatching is shown for the inner sleeve in Figure 10. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to because Reference numbers 11, 12, and 13 are extensively discussed in the specification in connection with Figure 10, but they are not shown in Figure 10. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to because reference numbers 1 and 3 are shown in Figure 10 but not described in the specification. Undefined reference number 1 is also shown in Figure 11. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "5" has been used to designate both lines of flux in Figure 10, and survey tools in Figure 11. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

10. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "4" has been used to designate both a magnet in Figure 10, and an adapter sub in Figure 11. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

11. The disclosure is objected to because of the following informalities: inconsistent terminology. For example, throughout the specification the Applicant refers to cams, sleeves, eccentric sleeves, non-concentric sleeves, concentric sleeves, sleeves with an offset, sleeves without an offset, housings, eccentric housings, etc. It is unclear which of these terms are synonyms, as defined by the Applicant, and which of these terms designate unique structure. Applicant should thoroughly edit the specification and ensure that the terminology is clearly and precisely defined and consistent, and not confusing or internally contradictory. Applicant is also encouraged to ensure that specification fully supports the drawings and the claims.

Appropriate correction is required.

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12. The disclosure is objected to because in the Brief Description of the Drawings section, the description indicates that in Figure 2, the weighted side 20 of the device 10 is on the left, however, the weighted side is on the right side of the drawing.

The disclosure is objected to because of the following informalities: Figure 4A is not included in the Brief Description of the Drawings section.

In the Brief Description of the Drawings section, the device in Figure 5A is described as making a right turn, but the device is apparently making a left turn.

In the Brief Description of the Drawings section, the device in Figure 5B is described as making a left turn, but the device is apparently making a right turn.

In the Brief Description of the Drawings section, Figure 9 seems to be described as a cross section of Figure 8 taken at A-A. This is an incorrect description.

Contrary to the description in the Brief Depiction of the Drawings, the reference numbers in Figure 11 do not specifically identify an MWD tool, and it is unclear from the specification that the disclosed embodiment can be "used for left/right borehole correction only," as stated in the Figure 11 description.

On page 23 line 11, Applicant refers to Figure 8A, however, there is no Figure 8A.

Figure 12 C is not described or referenced in the Detailed Description of the Invention section.

Claim Objections

13. Claim 31 is objected to because of the following informalities: inconsistent terminology. Claim 31 refers to the "heavy side" of the housing, however, as described in claim 1, the term should be the "weighted side." Appropriate correction is required.

Claim Rejections - 35 USC § 112

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claim 51 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 51 requires the track portion of the sleeve rotating mechanism to be located on the outside surface of the direction controller. The specification describes the direction controller as comprised of two eccentric sleeves 12, 13. Locating the track mechanism on the outside surface of the sleeve assembly 12, 13, would put the track on the outside of the device 10, which is not shown in the drawings or described in the specification.

16. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

17. Claims 2, 6, 21, 22, 33, 35, 38, and 46 are rejected under 35 U.S.C. 112, second paragraph.

Claims 2, and 6, are rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim cites the limitation "said centerline is halfway along the length of the housing in the direction of rotation." It is unclear as to which center line the claim refers. For example, Figures 1 and 3 show an axial centerline, while Figure 4 depicts as many as 3 centerlines, and Figure 4A depicts 2 centerlines. From the description in the claim, it is unclear if the centerline bisects the component (the

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housing 13) laterally, or axially, and the description of the centerline as "in the direction of the rotation axis" is also confusing. Additionally, the centerlines of the component may change significantly depending on the configuration of the direction controller and associated survey tools, subs, and equipment. There is also a lack of antecedent basis in claim 6 for the limitation "the centerline."

Regarding claim 21, the phrase "more preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claim 22, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claims 33 and 35 recite the limitation "said radial position." There is insufficient antecedent basis for this limitation in the claims. In claim 35, it is also unclear as to exactly which component the term "radial position" applies to.

Claim 38 recites the limitation "said geological strata." There is insufficient antecedent basis for this limitation in the claim.

Claim 46 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 46 is dependent on claim 43. Claim 43 describes an apparatus comprising a drilling member controlled by a directional controller. Claim 46 indicates that the drilling member comprises an apparatus according to claim 1. The apparatus in claim 1 already includes a directional controller.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 1-5, 7-9, 18-20, 22-35, and 47-53, are rejected under 35 U.S.C. 102(b) as being unpatentable over U.S. Patent 5,979,570 to McLoughlin.

With respect to claims 1- 4, 7, 8, and 30, McLoughlin discloses an apparatus 10 for selectively controlling the direction of a well bore 2 comprising a mandrel 11 capable of passing well bore fluids, and rotatable about a rotation axis; a direction controller 10 comprising at least two parts 12, 13, configured to apply a force to said mandrel with a component perpendicular to said rotation axis; a housing 13 having an eccentric longitudinal bore forming a weighted side 20 and configured to freely rotate under gravity; and a driver 26, 27, for selectively varying the angle of force relative to the weighted side 20 of the housing 13 about said rotation axis, the driver 26, 27, being configured to move the two parts 12, 13, independently of one another. The at least two parts 12, 13, are configured to apply a null force to said mandrel 11.

With respect to claims 5, and 9, the sleeve 12 comprises a first part, which has an eccentric bore, and a second part that has an eccentric bore. The sleeve 12 is located at least partially within the eccentric bore of the housing 13.

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With respect to claim 6, the sleeve comprises a first part 12, which has an eccentric bore, and a second part 11, which has a concentric bore. Note: Because of the undefined nature of the term "centerline," as used in this claim, the term is read very broadly (see item 17 supra).

With respect to claims 18-20, the device includes two stabilizer shoes 21, located on the outside of the housing 13. The stabilizer shoes 21 are offset by a predetermined amount in relation to the weight of the housing 13.

With respect to claim 22, the driver 26, 27, comprises a hydraulic or electric motor 26, as described in column 8, lines 50-60.

With respect to claims 23-29, and 31-33, in column 10, lines 54 to 70, and column 11, lines 1-52, McLoughlin describes a logic means and technique to signal the surface as to the position of the eccentric sleeve. The sensor signal is decoded at the surface and the logic means sends signals via mud pulses or electrical signals back down to a logic means associated with the direction controller 10, where the logic means decodes the signals and responds as appropriate. Specifically, lines 48-52 indicate that the logic means may be an integral part of the direction controller 10, or may be located completely separate from the direction controller 10. Furthermore, an energy source or power pack for supplying the logic circuits can be located within the tool.

With respect to claims 34 and 35, column 11, lines 32 to 45, describe an apparatus 10 wherein a mandrel 11 is connected to a drill string 9 wherein drilling parameters include drill pipe 9 rotation and the logic means includes a means for detecting drill string 9 rotation and determining a time period between rotation and non-rotation wherein the time period determines

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when the angle of force should be changed with respect to the weighted side 20 of the housing 13.

With respect to claims 47-53, Figure 8 discloses a drive wheel 26 and track 25, 27, said drive wheel engagable with said track 25, 27, such that movement of the drive wheel 26, causes movement of said track 25, 27, relative to said drive wheel 26. The drive wheel 26, when stationary, prevents movement between the track 25, 27, and drive wheel 26, the drive wheel 26, and track 25, 27, being located such that movement of the drive wheel 26, effects relative movement between the force and weighted side 20 of the housing 13. The track 25, 27, is located on the inner surface of the housing 13, which is part of the directional controller 12, 13. The drive wheel 26, comprises a plurality of teeth, which interlock with the teeth on the track 25, 27. The direction of force is changed in response to the rotation of the drive wheel 26.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 38-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over McLoughlin in view of U.S. Patent 5,439,064 to Patton.

With regard to claims 38-46, McLoughlin discloses the invention substantially as claimed, however, McLoughlin does not disclose a sensor coupled to the directional controller that senses geological data, and supplies the data to the directional controller. In Figure 4, and in column 7, lines 25-42, Patton discloses a compliant sub/directional controller 66 that provides

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mechanical control of direction of penetration. The directional controller 66 includes near bit sensors 86 that provide formation information including, among other things, gamma ray information. Down hole equipment also includes several other sensors including strain sensors 564a, 564b, and tension compression sensors, 562a, 562b, which sense formation information as encountered by the bit. Figure 17 shows, in part, how the sensed information is processed and compared to anticipated lithology characteristics to allow for essentially continual correction of the directional control apparatus. In column 24, lines 28-35, Patton describes this process as the "automatic adaptive directional control process." Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus disclosed in McLoughlin to include the geological sensor as disclosed by Patton. One would have been motivated to make the modification because in column 26, lines 5-10, Patton teaches that the adaptive system provides a swift and accurate response to anisotropic drilling properties of a formation during drilling. More generally, column 5 lines 1-4 indicates that the system is capable of drilling a high quality bore hole accurately along a three dimensional well profile plan.

Allowable Subject Matter

22. Claim 21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

23. Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art includes U.S. Patent 4,697,650 to Fontenot and U.S. Patent 5,358,059 to Ho, and U.S. Patent 3,626,482 to Quichaud, teaching the measurement of formation properties

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while directional drilling.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert D. Jones whose telephone number is 703-305-6296. The examiner can normally be reached on 8:30AM - 7 PM Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 308-2151. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-3597 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-4180.

rdj
December 23, 2002


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